

EREDETI KÖZLEMÉNY

Reliability and Validity of the Turkish Version of the Brief Scales for Coping Profile in textile workers

Ozlem Koseoglu ORNEK, PhD, Guler Yavuz TEMEL, PhD

SUMMARY

The aim of this study is to adapt the BSCP (Brief Scales for Coping Profile) scale to Turkish and to investigate its psychometric properties among textile workers.

Methods: This a psychometric study with cross-sectional design. After translation procedures, the BSCP was administered to workers. Content validity of the BSCP was investigated with the CVI index and reliability was investigated with Cronbach's Alpha. The construct validity was investigated with exploratory and confirmatory factor analysis.

Results: The psychometric properties of the original BSCP were supported by the Turkish version of the BSCP. According to the exploratory factor analysis, the BSCP had six subscales. The reliability of the BSCP subscales' values were 0.692, 0.712, 0.661, 0.756, 0.786, and 0.777 respectively.

Conclusion: The Turkish version of the BSCP showed acceptable reliability and validity which is the first adapted scale in Turkey for evaluating workers' coping profiles. The scale will be a good option to provide basic data about workers' coping profiles which may be used for prolonging stress management skills and health promotion programs by occupational health and psychiatric nurses, physicians, psychologist and safety experts.

Keywords: BSCP scale, coping profiles, work related stress, reliability, textile workers

A Brief Scales for Coping Profile mérőeszköz török nyelvű változatának reliabilitása és validitása textilipari dolgozók körében

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ÖSSZEFOGLALÁS

A vizsgálat célja: adaptálni a BSCP (Brief Scales for Coping Profile) skálát török nyelvre és megvizsgálni a pszichometriai jellemzőket a textilipari dolgozók körében.

Anyag és módszer: A pszichometriai elemzés keresztmetszeti vizsgálatként valósult meg. A kérdőív fordítását, nyelvi adaptálását követően a BSCP a dolgozók körében terjesztésre került. A BSCP szakmai validitás mérése CVI (Content Validity Index) meghatározásával történt, míg a reliabilitás vizsgálat a Cronbach-alfa mutatóval. A mérőeszköz validitásának vizsgálata feltáró és megerősítő faktoranalízissel valósult meg.

Eredmények: A pszichometriai jellemzői az eredeti BSCP-nek megegyeztek a török verzióval.

A feltáró faktoranalízis meghatározása alapján a BSCP-nek 6 alskálája van. A BSCP alskáláinak reliabilitás értéke 0.692, 0.712, 0.661, 0.756, 0.786, illetve 0.777 volt.

Következtetések: A törökre fordított verziója a BSCP-nek megfelelő reliabilitását (megbízhatóságot) és validitást (érvényességet) mutatott, amely így az első adaptált mérőeszköz Törökországban a textilipari dolgozók coping profiljának méréshez. A skála jó lehetőséget kínál a munkavállalók megküzdési készségének felméréséhez, mely adatok használhatóak a foglalkozás-egészségügyi, munkavédelmi és pszichiátriai területeken dolgozók szakemberek által megvalósuló stressz menedzsment tréningeknél és egészségfejlesztő programoknál.

Kulcsszavak: BSCP skála, coping profilok, munkahelyi stressz, reliabilitás, textilipai munkás

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Introduction

In Turkey, there are 30,855,000 employees according to recent official data. Labour force participation rate is almost 52%. Among the working sector, textile and clothing is the most popular field after

the automotive sector (TurkStat, 2017). Turkey was within the first 15 textile-exporting countries in 2012 after Taiwan (ILO, 2014). It is very clear that there are many risk factors such as job stress at the workplace which have a strong influence on workers' health but no national comprehensive research has

been conducted yet. However, it is still possible to estimate the outcomes of job stress according to data in the United Kingdom and Japan. In 2015/2016, job stress caused 45% days of lost work and 37% work related health problems in Great Britain (Health and Executive, 2016). More than 60% of workers in Japan have anxiety and more than half of Japanese workers were found to be on leave due to mental health (Tomotsune et al., 2009).

Coping strategies are key factors for dealing with and controlling work related stress. These can be classified as problem-focused and emotional-focused coping strategies. Each classification of the strategies has different ways of cognitive procedure, behaviours and outcomes (Nakagawa et al., 2014). Problem-focused coping forthrightly address stressors while emotional-focused profiles alleviate stress responses instead of assaying to resolve job stressors (Takeda & Watanabe, 2017). Socio-economic conditions, demographic characteristics, social support, culture, experience, knowledge and skills, workload, working hours, role uncertainty, job insecurity, and social power have important effects on workers' job stress and coping profiles (Cortina & Wasti, 2005; Inoue, Kawakami, Eguchi, & Tsutsumi, 2016). Coping profiles of workers can be related to healthy life behaviour, perceived stress level, mental health problems and the success of controlling stress. In the study of Doron, Trouillet, Maneveau, Neveu, and Ninot, 2014; high copers and avoidant copers showed higher level of perceived stress and unhealthy behaviour while adaptive copers were found to have less stress and more healthy behaviour (Doron, Trouillet, Maneveau, Neveu, & Ninot, 2015). Workers that have dinner late in night had a significant correlation with perceived stress, and the ones who reported perceived stress had "emotional expression involving others" coping profile (Suzuki, Sakurazawa, Fujita, & Akamatsu, 2016). Avoidance and suppression coping profile was found to be correlated with depression, somatic symptoms, negative thoughts among persons who had irritable bowel syndrome (Sugawara et al., 2017), and low back pain with nurses was found to be associated with the "changing point of view" profile (Takeda & Watanabe, 2017).

People spend much of their life time at work. Working conditions and environments have strong influences on job stress. In that regard, it is vital to know how workers cope with stressors. Therefore, basic data about the coping profiles of workers are needed to plan intervention programs at the work place for improving effective coping strategies. Also, this data is essential for the development of valid and reliable measurements. Generally, there are variety

scales or questionnaires that measure coping strategies which are used internationally but seldom in Turkey. For example, the ways of coping questionnaire, COPE inventory, the coping flexibility scale, the perceived ability to cope with trauma (Cheng, Lau, & Chan, 2014) and Coping with Harassment Questionnaire (Cortina & Wasti, 2005) have been used abroad. The Brief COPE scale also has been used widely in research to assess coping strategies which contains 28 items and 14 two-item subscales (Butler et al., 2016; Doron et al., 2015; Gambetta-Tessini, Marino, Morgan, & Anderson, 2016; Tabala, Wrzesińska, Stecz, & Kocur, 2016). Among coping measurements, the Coping style scale has been used in Turkey which was derived from Lazarus and Folkman's Ways of Coping Inventory. However, the main purpose of the scale was assessing students' profiles but it also has been used with a variety of members of the community except workers. It contains 30 items and 5 subscales (Duygun & Nilhan, 2013; Ekinçi, Altun, & Can, 2013; Engin & Yılmaz, 2016; Sahin & Durak, 1995; Selçuk et al., 2016; Tumkaya, 2016; Yılmaz & Beji, 2010). Among the coping profiles' measurements, The Brief Stress Coping Profile (BSCP) scale was developed with the purpose of measuring coping profiles of workers. It has been used widely internationally in many different studies (Kaneko & Momino, 2015; Suzuki et al., 2016; Takeda & Watanabe, 2017; Tomotsune et al., 2009; Yamagishi et al., 2007). The BSCP consist of 18 items and corresponds to various coping profiles (Kageyama, Kobayashi, Toshio Kawashima, & Kanamaru, 2004).

Due to the lack of a well-established short recent coping profile scale in Turkey, the study investigated the reliability and validity of the Turkish version of the BSCP in the textile factory workers.

Methods

Procedures and Participants

The population group of the study consisted of 553 textile workers from three textile factories in Istanbul, Turkey. The scale was conducted in the factories by a researcher in February 2016. Initial recruitment targeted all workers who were older than 18 years, had no diagnosed psychological or psychiatric diseases and who were literate. However, only 540 workers fully completed the questionnaire because 2 workers declined to participate, 3 of them had a diagnosed psychological health problem, 3 workers submitted incomplete questionnaires, 3 workers were illiterate and 2 workers were on sick leave on the days that the data was collected. The

final sample included 294 (54.4%) males and 246 (45.6%) females. The mean age of the participants was 33.34±10.22 years. Almost 79% of them graduated from elementary school and 19% of them graduated from high school. Over 67% of them expressed their economic condition as “good” and 25.6% of them expressed it as “bad”. The average of daily working hours was 11.46±1.36.

Ethical Consideration: The Ethics Committee of Istanbul Medipol University approved the study procedure (approval no: 10840098-299).

Instrument

The Brief Stress Coping Profile

The BSCP consisted of 18 items rated on a 4-point scale (often, sometimes, seldom, or never). It is a self-rating scale for assessing workers' coping profile. It was developed by Kageyama, Kobayashi, Kawashima, and Kanamaru, (2004) (Kageyama et al., 2004). It has 6 subscale which are; “Active solution (the item 1,2,3)”, “Seeking help for solution (the item 4,5,6)”, “Changing mood (the item 7,8,9)”, “Changing a point of view (the item 10,11,12)”, “Emotional expression involving others (the item 13,14,15)” and “Avoidance and suppression (the item 16,17,18)”.

Appendix 1: Kısa Baş Etme Yöntemleri Ölçeği

Sıkıntılı veya zor bir sorunla karşılaştığınız durumda, o sorunla baş etmek için genelde ne yaparsınız? Aşağıda belirtilen yöntemleri okuduktan sonra karşılarında verilen sıklıklardan size uygun olanı çarpı (X) koyarak işaretleyiniz, lütfen

Sıkıntılı ve zor bir durumla karşılaştığınızda:	Hiç(1)	Nadiren(2)	Bazen(3)	Sık sık(4)
Sorunun nedenlerini inceleyerek çözmeye çalışırım.				
Yaşadığım sorunun geçmişteki sorunlarla bir ilişkisi olup olmadığına bakarım.				
Sakin bir şekilde düşünürüm.				
Güvenebileceğim birine danışırım.				
Soruna dahil olan insanlarla konuşarak sorunu çözmeye çalışırım				
Sorunu çok yakından bilen birine danışırım.				
Hoşlandığım ve eğlendiğim şeyleri yaparak dikkatimi/kafamı dağıtmaya çalışırım.				
Beni sakinleştirecek, rahatlatacak şeyleri yapmaya çalışırım				
Kendimi yenilememi ve dinlenmemi sağlayacak aktiviteler yapmaya çalışırım (örneğin seyahat yapmak ya da dışarı çıkıp hava almak gibi)				
İyimser olmaya çalışırım				
Olayın pozitif tarafını görmeye çalışırım				
Yaşadığım sorunun benim için iyi bir deneyim olduğunu düşünmeye çalışırım.				
Bu sorunun arkasında/nedenin birisinin olduğunu düşünürüm				
Sorunun yaşandığı/sorunu yaşadığım kişiyi suçlarım				
Sorunla ilişkisi olmayan birine içimi dökerim.				
Sorunu görmezden gelirim				
Hiçbir şey yapmadan sorunu zamana bırakırım, bir gün değişecek diye düşünürüm.				
Soruna tahammül etmekten ve dayanmaktan başka hiçbir şey yapmam.				

Each of these subscales has 3 items and has a score range of 3-12 points. If a respondent shows a high score for a subscale, this means he/she frequently chooses that kind of coping method (Tomotsune et al., 2009). The Cronbach's alpha coefficients in the original BSCP scale ranged from 0.64 to 0.77 (0.71 for Active solution, 0.69 for Seeking help for solution, 0.77 for Changing mood, 0.71 for Changing a point of view, 0.64 for Emotional expression involving others, 0.72 for Avoidance and suppression). A principal axis factor analysis yielded a six-factor structure (Kageyama et al., 2004).

Translation Procedure

The BSCP was first translated from English into Turkish by a bilingual language expert and an occupational health professional. Then, the scale was translated back into English by two translators (medical physician and psychologist consultant). The English, Turkish and “back-translated” versions were discussed by an expert panel on occupational health. The preliminary version of the Turkish BSCP scale (**Appendix 1**) was formed after this discussion and comparison of the versions. In a pilot study, the textile workers (N: 25) found this version to be understandable, meaningful and relevant.

Statistical Analyses

This study aimed to investigate the psychometric properties of the BSCP. First of all, translation of the scale was completed. Then, validity and reliability of the scale was investigated. Content validity index was used for evaluation of the BSCP's validity. Construct validity of the BSCP was investigated with exploratory and confirmatory factor analysis. Reliability of the BSCP was computed with Cronbach's Alpha which determines the internal consistency of the items.

Content Validity Procedures

Content validity was conducted to assess the clarity, correlation and comprehensiveness of the developed Turkish version of the BSCP. The content validity index (CVI) used was developed by Waltz and Bausell in 1983 (Waltz & Bausell, 1983). The content validity was assessed by an expert panel of 6 academics, with three from the field of public health nursing, one from psychiatric nursing, one from public health (physician) and one from the psychology field. The panellists rated the relevance and feasibility of each item on a scale from 1 (least relevant) to 4 (highly relevant). The CVI scale was calculated by dividing the number of each item rated either 3 (relevant but needing minor revision) or 4 (very relevant) by the total numbers of items. It is indicated by many researchers that a CVI scale of 0.80 score or higher is acceptable for confirming expert validity (Polit & Beck, 2006).

Results

The results of validity and reliability of the BSCP is given below.

Content Validity

Content validity was analysed with the CVI index. In the present study, the CVI was computed to be

0.88. Construct validity of BSCP was investigated with exploratory and confirmatory factor analysis and reliability of the scale was computed with Cronbach's Alpha. Factor structure of the BSCP was determined with exploratory factor analysis. The scale was administered to 540 people. Exploratory factor analysis was examined with 180 of them and Confirmatory factor analysis was examined with 360 of them.

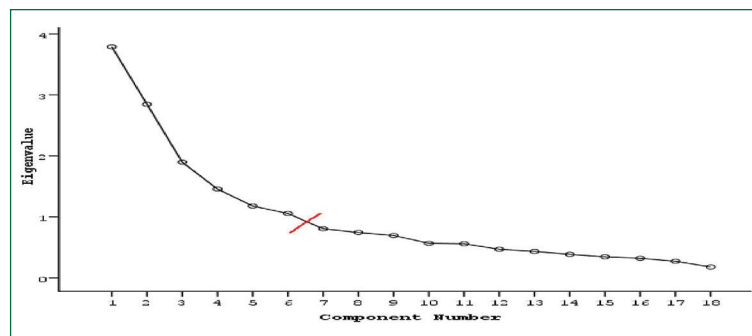
Construct Validity

Exploratory Factor Analysis

First of all, Kaiser-Meyer-Olkin (KMO) value and Bartlett's Test was investigated. According to the results, the KMO index was 0.703 and the Bartlett Test's value was smaller than 0.05 ($p=0.000$). For accepting the sample adequacy, KMO and the Bartlett's test played an important role. Because the index of KMO was over 0.06 and the Bartlett's Test of Sphericity was less than 0.05, the sampling adequacy was accepted as suitable for factor analysis (Kaiser, 1974). The number of significant factors was investigated with the table of the Total Variance Explained. The six factors have eigenvalues greater than 1.0 (which is a common criterion for a factor to be useful). For determining the number of the factors, one of the important criteria is the scree plot (Cattell, 1966) which shows the eigenvalues on the y-axis and the number of factors on the x-axis. It always displays a downward curve. The point where the slope of the curve is clearly levelling off (the "elbow") indicates the number of factors that should be generated by the analysis. According to the scree plot the last big drop occurred between sixth and seventh components, so six components were chosen (see figure 1).

The table of component matrix shows the factor loadings for each variable and the loadings (extracted values of each item under 6 variables) of the eighteen variables on the six factors extracted (see table I).

Figure 1: Scree Plot of the Turkish Version BSCP



Confirmatory Factor Analysis

According to the results of the exploratory factor analysis, the BSCP had six factors and the results were similar with the original scale. In addition to this, the factor structure of the scale was also investigated with confirmatory factor analysis (CFA). The model which consisted of six factors provided a good

Table I. Table of Component Matrix of the Turkish Version BSCP

Items	Components					
	1	2	3	4	5	6
Item 14 <i>I blame the person who arising the problem / I had a problem with.</i>	,853					
Item 13 <i>I think that there is someone else behind this problem/matter.</i>	,822					
Item 15 <i>I talk to a person who has no relation with the problem.</i>	,740					
Item 11 <i>I try to see positive sides of the matter.</i>		,856				
Item 12 <i>I try to think that this problem is a good experience for me.</i>		,787				
Item 10 <i>I try to be optimistic.</i>		,683				
Item 17 <i>I do nothing and let time go, I think that it will change one day.</i>			,868			
Item 16 <i>I ignore the problem.</i>			,798			
Item 18 <i>I do nothing aside from to tolerate and resist to the problem.</i>			,787			
Item 4 <i>I take advise from one of my friends that I trust.</i>				,816		
Item 5 <i>I try to solve the problem with talk to people who have interest in the problem.</i>				,769		
Item 6 <i>I take advise from a person who had information about the problem.</i>				,543		
Item 2 <i>I try to find if there has got a relationship between the problem and my past or not.</i>					,830	
Item 1 <i>I try to solve the problem by analyzing reasons.</i>					,750	
Item 3 <i>I think calmly.</i>					,643	
Item 9 <i>I try to do activities whşch will help me to refresh and rest myself (for example, to travel or to take air, etc)</i>						,792
Item 8 <i>I try to do activities which will calm me down and help me.</i>						,717
Item 7 <i>I try to abstract my attention with my hobbies and entertainment.</i>						,671

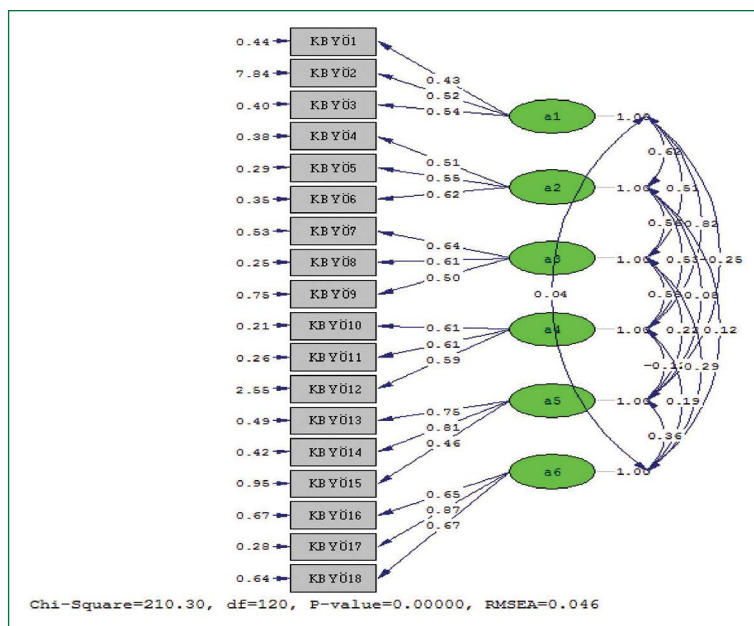
Table II. Confirmatory Factor Analysis, FIT Indices Results of the Turkish Version BSCP

n	Chi-square (df)	χ^2/df	CFI	NFI	NNFI	IFI	GFI	RMSEA
360	210.30 (120)	1.753	0.96	0.92	0.95	0.96	0.94	0.046

model fit. The CFA fit indices of the model are given in **Table II** and the path diagram of the model is given in the **Figure 2**.

First of all, fit indices were examined to evaluate the overall fit. The chi-square goodness-of-fit statistic was statistically significant but the chi-square statistic is sensitive to the sample size, so it is rarely used as a sole index of the model fit. An adjunct discrepancy-based fit index is the ratio of chi-square to degrees of freedom (χ^2/df). If that ratio is in the range of 2 to 3, it is indicative of an acceptable fit between the hypothesized model and the sample data (Tabachnick & Fidell, 2007). According to Table 2, this value was computed as 1.753 and the model demonstrated an acceptable fit. In addition

to these, several indices of fit (CFI (0.96), NFI (0.92), NNFI (0.95), IFI (0.96), GFI (0.94)) were examined. All these incremental indices are scaled from 0 (no fit) to 1 (perfect fit). Researchers (Kline, 2005; Tabachnick & Fidell, 2007) advise that values close to 0.95 are indicative of a good fit. According to the results of the study, all indices were close to 0.95. Finally, the root mean square error of approximation (RMSEA) is a population discrepancy function that compensates for the effects of the model's complexity. The closer the RMSEA coefficient is to 0, the better the fit of the model. The RMSEA value of .05 or less indicates a close fit of the model in relation to the degrees of freedom, whereas a value of .08 or less indicates a reasonable error of approximation. In this

Figure 2: Path Diagram of the Model of the Turkish Version BSCP

study RMSEA was computed as 0.046. According to all these results, the model which had six factors, demonstrated a good fit.

Reliability (Internal Consistency)

The reliability of the BSCP' factors was determined with the Cronbach Alpha coefficient. Such as, the reliability of the "Active solution" factor was computed as 0.692, the reliability for the "Seeking help for solution (the item 4,5,6)" factor was 0.712, for the "Changing mood" was 0.661, for the "Changing a point of view" was 0.756, for the "Emotional expression involving others" was 0.786 and "Avoidance and suppression" was 0.777.

Discussion

The present study investigated the validity and reliability of the Turkish version of the BSCP for assessing stress coping profiles in textile workers. The BSCP, originally developed for Japanese workers, is documented to assess coping profiles and consists of 6 different subscales covering a broad domain of coping strategies of workers' job stress experiences. The six subscales can be used separately. It does not have a total score (Kageyama et al., 2004). It is short and easy to implement at work.

Validity

The CVI score (0.88) indicated that the BSCP had good content validity. The KMO index and

Bartlett's test results shows that the sampling adequacy was accepted as suitable for factor analysis. According to the results of the total variance explanation and scree plot, the Turkish version of the BSCP has six factors too and the present results of this study were supported by the original BSCP (Kageyama et al., 2004). The six subscales explained 67.8% of variance. The Exploratory factor analysis (EFA) found that the item factor loadings ranged from .54 to .86. However, the item factor loading in the original development of the BSCP was between .49 and .84 (Kageyama et al., 2004). After the EFA evaluation in the present study, Confirmatory Factory Analysis (CFA) was conducted

for assessing the scale. The CFA indicated that the Turkish BSCP had a good fit index (Harrington, 2009).

Reliability

The reliability analysis in this study indicated an acceptable internal reliability of the BSCP scale, as Cronbach Alpha scores of all six subscales were over 0.66. The internal consistency of the original study, the Cronbach Alpha scores for each sub-scale was as follows: Active solution=0.71, Seeking help for solution= 0.69, Changing mood= 0.77, Changing a point of view=0.71, Emotional expression involving others=0.64 and Avoidance and suppression=0.72. The Cronbach Alpha score indicated that the reliability of the Turkish version of the BSCP had an acceptable index (Tavakol & Dennick, 2011). Compared to findings in the original Japanese version of the BSCP, four subscales showed better reliability in the present study. Tomutsune et al, (2009) used the BSCP scale for assessing employees in educational and scientific institutions in Japan. Active solution($r=0.86$), Seeking help for solution($r=0.80$) and Changing mood($r=0.78$) subscales had higher Cronbach Alpha's scores when compared to the present and the original BSCP studies (Tomotsune et al., 2009). However, "Changing a point of view", "emotional expression involving others" and "avoidance and suppression" subscales internal consistency in the present study was better than both studies above in Japan.

Conclusion and Recommendations

The current study translated and assessed an internationally recognized brief measurement tool for stress coping profiles of workers, the BSCP, into Turkish. The results showed that the scale has acceptable validity and reliability. The Turkish version of the BSCP is the first adapted scale in Turkey for evaluating workers' coping strategies. The scale will be a good option to provide basic data about workers' coping profiles which may be used for prolonging stress management skills and health promotion programs by occupational health and psychiatric nurses, physicians, psychologist and safety experts. It is short and easy to conduct at the workplace. The sample of the study does not represent all the workers in Turkey. Therefore, the results should not be generalized to all workers in

Turkey. In addition, further testing of the Turkish version of the BSCP with different sector's workers and socioeconomic class is recommended.

Conflict of interest

There is no conflict of interest in this study.

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